



MTBE Summary of Facts

Fact sheet

12/2009

What is MTBE?

MTBE stands for Methyl Tertiary Butyl Ether. It is commonly used as a gasoline additive to reduce engine knocks. MTBE is being tested to see if it causes cancer or other health problems. The U. S. Environmental Protection Agency is working to reduce the use of MTBE as a gasoline additive as a result of the taste and odor problems in water and unreasonable risk to the environment.

What is the concern about MTBE?

It's showing up in groundwater all over the country, and it's tough to clean up.

Is MTBE still in gasoline in Missouri?

No. A law effectively banning MTBE in Missouri's gasoline supply was passed in 2002. A phase-out was concluded July 1, 2005.

MTBE and Missouri's Water

How did MTBE get into drinking water?

MTBE can enter the water through gasoline spills, gasoline storage tank leaks, or discharges from two-cycle engines on motorboats and other watercraft. It also enters the atmosphere from airborne emissions from vehicles. MTBE travels through groundwater faster than the other components of gasoline. It does not readily break down.

How will I know if I have MTBE in my water?

Public water systems are routinely tested for MTBE and if any were present in your water system, officials would notify you. MTBE has a very unpleasant taste and a strong turpentine-like odor. If you are on a private well you would be able to smell or taste MTBE contamination long before it would get to a harmful level. EPA has set an advisory level of 20 to 40 parts per billion (ppb) based on the ability of people with a sensitive sense of smell being able to detect it in this range.

Who watches over my drinking water?

The Missouri Departments of Health and Senior Services and Natural Resources are responsible for protecting the quality of drinking water in Missouri. The Department of Health and Senior Services assists private well owners by offering routine water analyses to all well owners and special analyses on an as-needed basis. The Department of Natural Resources is responsible for making sure public water supplies are safe. The Department of Natural Resources also regulates well drillers to assure wells are properly constructed and to protect groundwater quality.



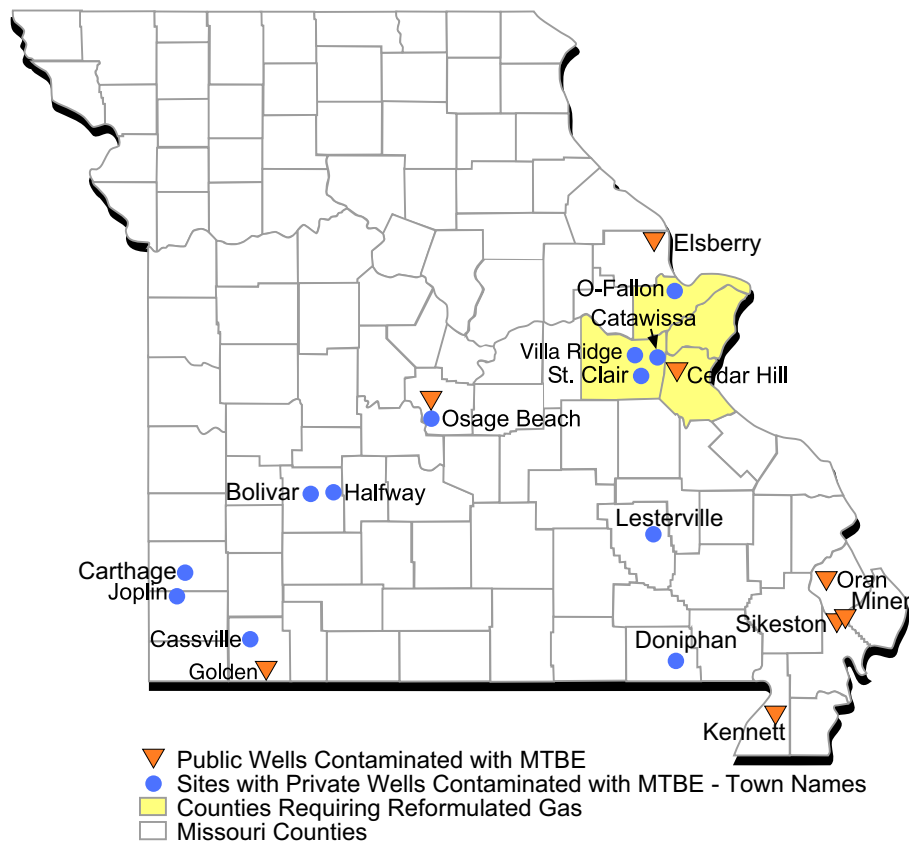
What should I do if I have a private well and suspect that it is contaminated?

For routine water sampling, you should first contact your county health department. If you think that your well is contaminated with MTBE, please call the Missouri Department of Health and Senior Services - Bureau of Environmental Epidemiology at 866-628-9891.

What if I get water supplied to me?

The Department of Natural Resources routinely monitors about 2,000 community public drinking water wells for MTBE and over 100 other potentially harmful compounds at least once every three years. Testing for MTBE began in 1995, so there have been several complete rounds of testing on every public well. The 70 public drinking water systems that use surface water are tested annually for MTBE. Your public water supplier will inform you of any problems. Community water systems publish an annual Consumer Confidence Report that lists all

Wells Contaminated with MTBE



(11/2009)

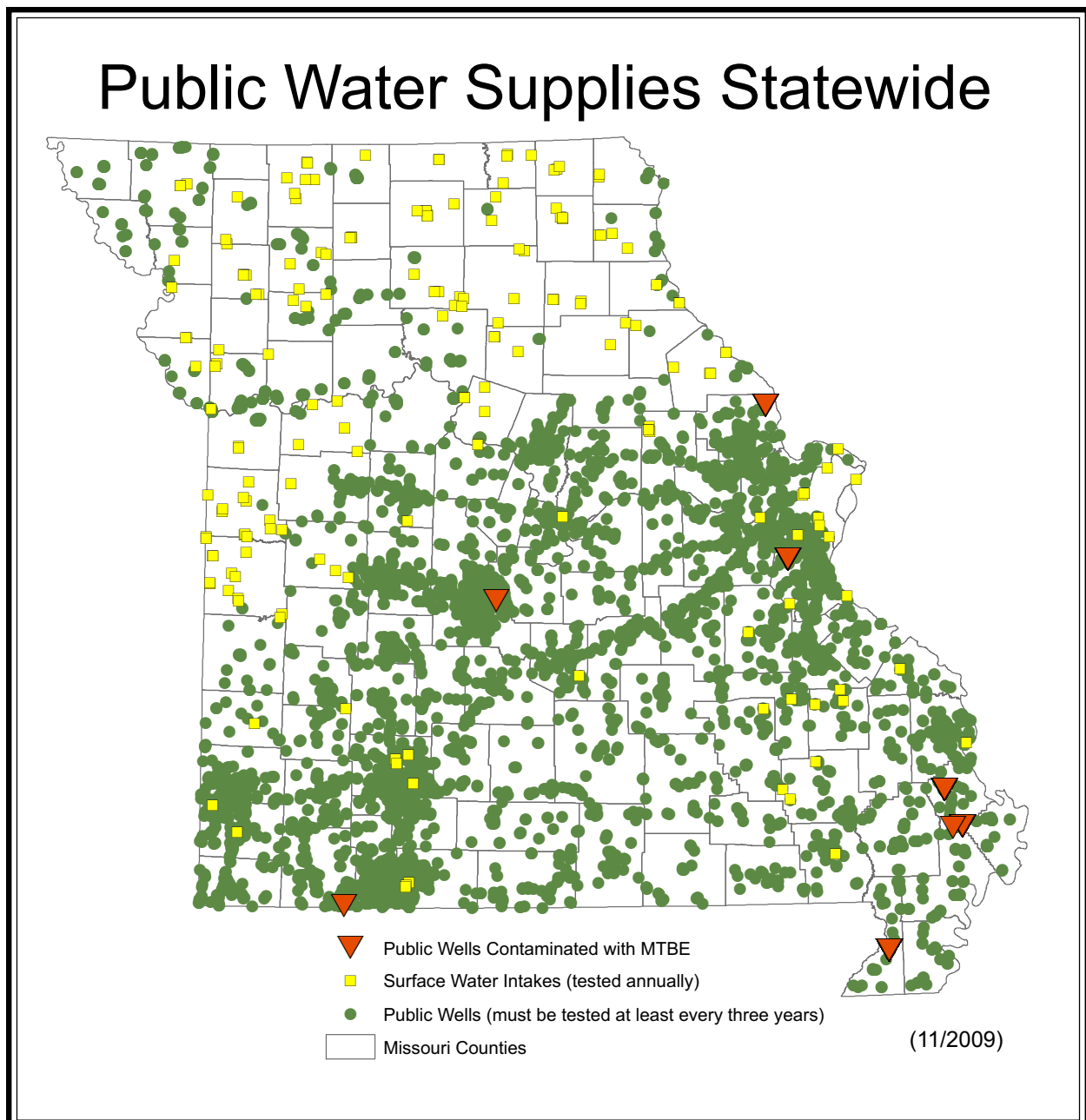
MTBE was a common ingredient in both conventional and reformulated gasoline. Reformulated gasoline is required in the city of St. Louis and Franklin, Jefferson, St. Charles and St. Louis counties. All community and non-transient non-community public water supplies are monitored for MTBE contamination. Fifteen public water supplies have shown detection of MTBE as of October 2009. A total of 66 wells at 37 sites have been detected since 1979.

detected contaminants. Water system information is also available on the department's Drinking Water Watch Web page at www.dnr.mo.gov/DWW/.

How big of a problem is MTBE in our water?

MTBE has been detected in 25 public drinking water wells at 16 different sites since the Department of Natural Resources has been testing.

MTBE has also been found in 41 private drinking water wells, bringing the total number of wells in Missouri contaminated by MTBE to 66 at a total of 37 different sites as of October 2009.



**Currently Active Sites Where MTBE has been Detected in a
Public or Private Drinking Water Well**
(The eight public sites are shown in shaded cells)

Name	City	Drinking Water Wells Impacted	Date MTBE first detected	Highest Concentration of MTBE detected (ppb)	How they get their drinking water now
1. The Inside Lane Inc.	Sikeston	1	1/8/2002	1,980	Well is out of service. Business connected to city water.
2. Oran	Oran	2	4/16/1999	87	New drinking water well installed north of town. Concentrations in downgradient monitoring wells are decreasing.
3. City of Kennett	Kennett	4	8/21/2006	Well #8 - 114 Well #5 - 1.69 Well #6 - 2.23 Well #9 - 2.80	Well #8 taken offline. Wells #5, 6 and 9 are still being used.
4. Big Boys Little Store	Osage Beach	2	3/23/2001	14.9	City water is now being used.
5. Ficken Hill Subdivision (U-Gas Cedar Hill)	Cedar Hill	2	4/21/1998	13.10	Level has subsided, well in use. Installed a new well.
6. Miner	Miner	2	9/23/2003	11.6	Currently using wells.
7. Shumaker Tire Co.	Golden	1	2/07/2003	4.29	Currently using well.
8. City of Elsberry	Elsberry	1	8/7/2002	1.17	Levels remain below advisory. Well still in use.
9. Blue Harbor Marina	Osage Beach	5	9/15/1992	17,000	New drinking water wells installed.
10. MPC 18	O'Fallon	3	11/17/1999	5,000	Connected to public water supply.
11. Sinclair Retail Station #24053	St. Clair	1	7/21/1997	1,370	New drinking water well installed.
12. Dohickies	Lesterville	1	7/23/2003	650	Installed a new well.
13. SOS Convenience Store	Cassville	1	8/26/1993	500	Impacted well replaced and SOS connected to city water.
14. Former J & K Grocery & Package	Doniphan	1	11/2/2001	195	Impacted water line replaced. Well not in use.
15. R & S MiniMart	Catawissa	7	6/17/1998	74.2	Installed 2 deeper wells. Residents on the remaining wells are still using their wells. Concentrations remain below MCLs.
16. Miltenberger Office Bldg.	Bolivar	1	8/12/2002	35	Bottled water being used.

Name	City	Drinking Water Wells Impacted	Date MTBE first detected	Highest Concentration of MTBE detected (ppb)	How they get their drinking water now
17. Al & Peg's Café	Halfway	1	9/24/1992	27	Connected to city water supply.
18. Metro Express	Joplin	3	2/4/1993	27	Connected to City of Joplin's water supply.
19. Wood Property (Villa Ridge Zephyr)	Villa Ridge	2	10/19/2000	8.7	Installed carbon filter.
20. Xpress Texaco Truck Stop	Carthage	1	7/28/1999	5.9	Carbon filtration system and chlorinator installed.
20 Total Sites		42 Wells Impacted			

EPA's Water Quality Advisory for MTBE = 20-40 ppb

Well replacement for some of these sites was financed through the Petroleum Storage Tank Insurance Fund. For more information visit the Petroleum Storage Tank Insurance Fund Web site at pstif.org.

The tables on pages 4 and 5 list all the contaminated sites, the date when MTBE was first detected and the highest concentration of MTBE measured. Levels higher than about 20 ppb can cause the water to have a bad taste and smell.

Are these the only places that need to be concerned about MTBE?

No, groundwater moves much more slowly than water in streams, thus many pollution problems aren't found until years after the pollution entered the groundwater. This means that we may find additional sites contaminated with MTBE in the future and it is why the Department of Natural Resources will continue to monitor public wells for MTBE.

How concerned should I be about MTBE contamination?

Most of Missouri's drinking water supplies come from treated surface water. Wells used for public drinking water supplies in Missouri are constructed to the state's highest standards. These wells are typically deeper than private wells and sealed more effectively to prevent near-surface contaminants from entering our drinking water. Private wells drilled since 1987 are also constructed to a higher standard than older wells. Drinking water from older, shallow wells or springs located near gasoline storage or transportation systems are the most likely to be contaminated. Consumers are only at risk if their water is contaminated.

How many gasoline storage tanks are there in Missouri?

There are nearly 10,000 underground storage tanks in use in Missouri and 31,182 tanks have been permanently closed in the last two decades. The Department of Natural Resources' goal is to inspect each of the active tanks in use approximately once every three years.

What is being done to check on underground tanks?

When a gasoline storage tank leaks, many harmful chemicals can flow into the groundwater. This has led Missouri to require new safety measures and to inspect all tanks. All underground tank operators must monitor their tanks and piping monthly. The records they keep are reviewed by department staff and staff of the Petroleum Storage Tank Insurance Fund. All tanks in use after Dec. 22, 1998, must meet strict design and operating requirements.

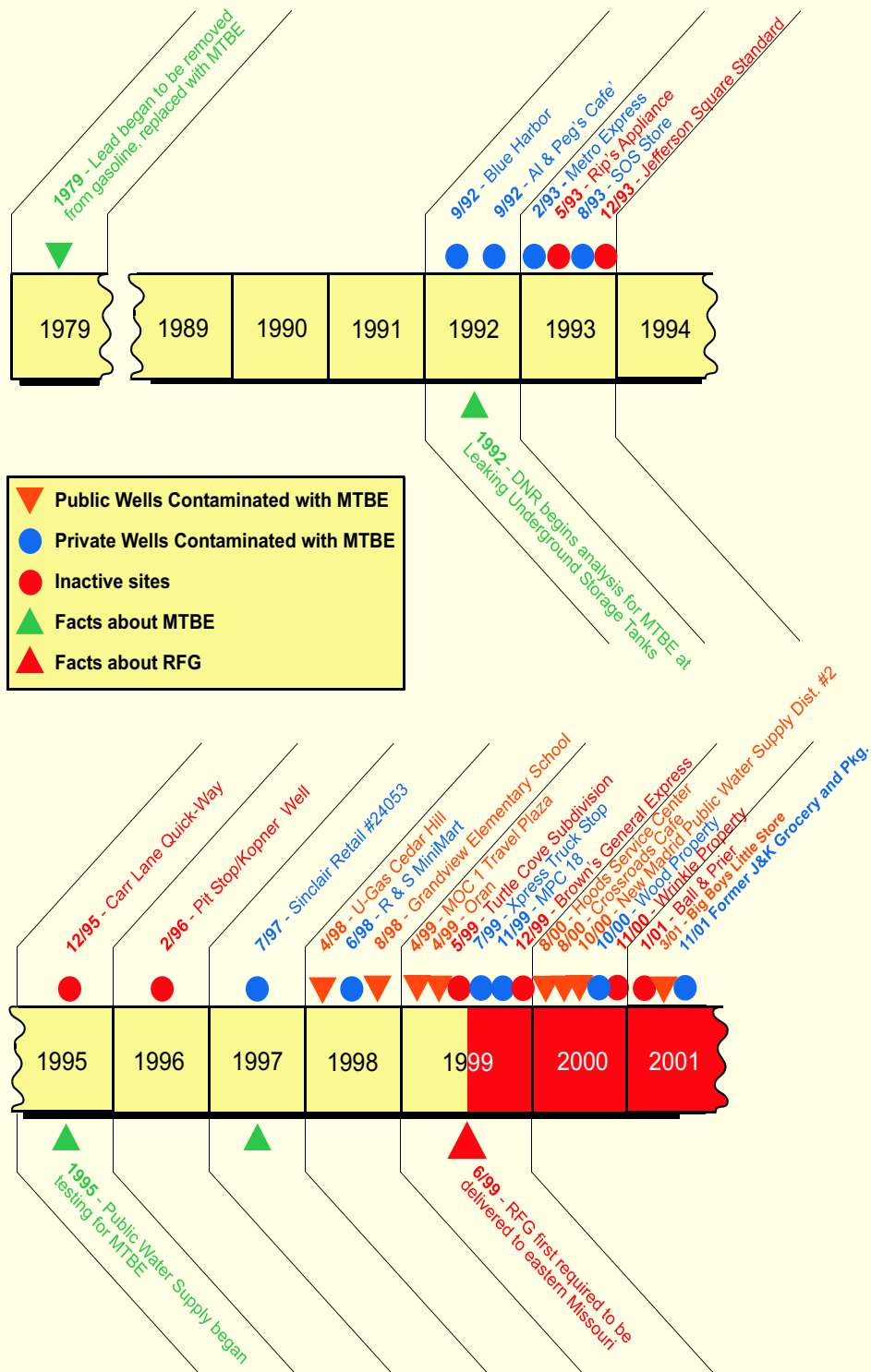
**Sites Where MTBE Has Been Addressed
After Being Detected in a Public or Private Drinking Water Well**

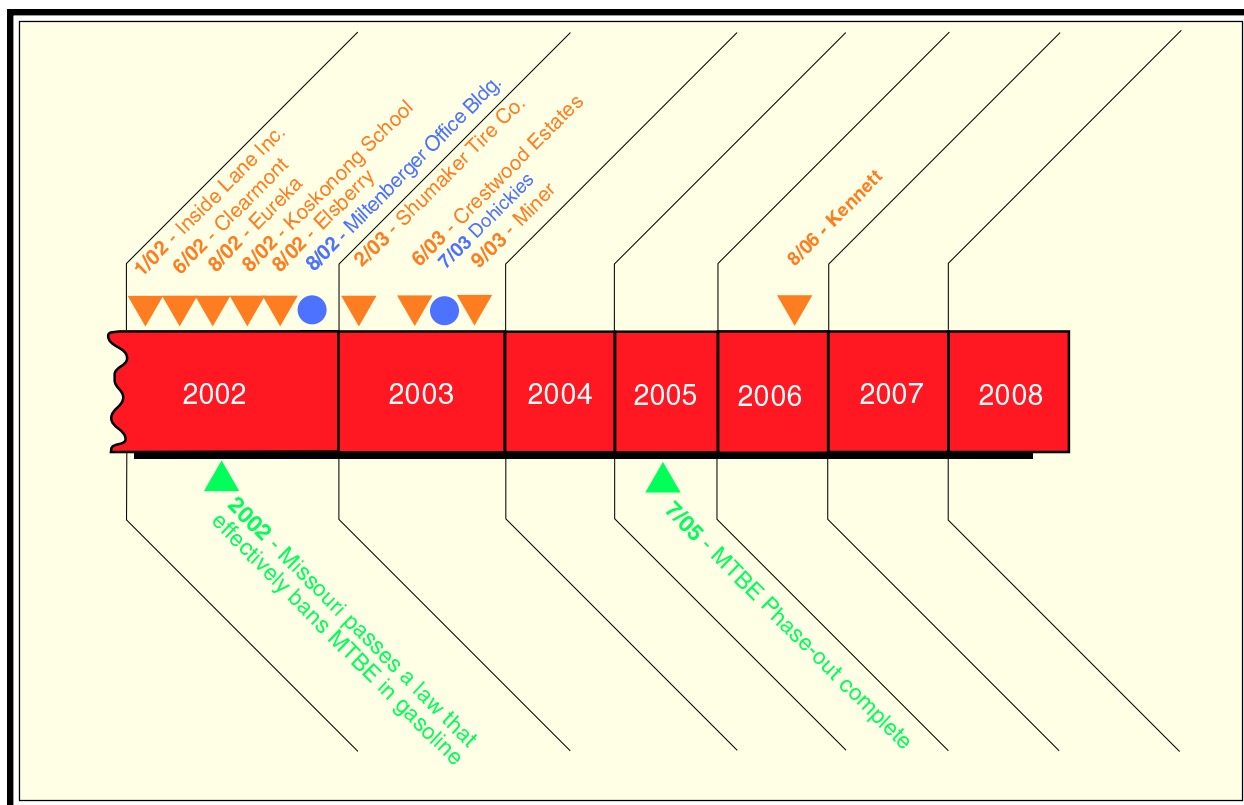
Name	City	Drinking Water Wells Impacted	Date MTBE first detected	Highest Concentration of MTBE detected (ppb)	How they get their drinking water now
1. Ball & Prier	Golden	1	1/19/2001	16,700	Bottled water.
2. Jefferson Square Standard	Desoto	4	12/27/1993	1,200	New drinking water wells.
3. Hood's Service Center	Bois D' Arc	1	8/01/2000	619	Drilled a new well.
4. Turtle Cove Subdivision	Kimberling City	1	5/10/1999	330	New drinking water well.
5. Crossroads Café	Miller	1	8/23/2000	59.8	Installed new well.
6. Pit Stop/Kopner Well	Arnold	1	2/15/1996	24	Alternative water source identified.
7. New Madrid Public Water Supply Dist. #2	Kewanee	1	10/24/2000	14.9	Constructed waterline and hooked onto the City of New Madrid.
8. Brown's Gen. Express	Brighton	1	12/3/1999	12.2	Bottled water.
9. Carr Lane Quick Way	Shell Knob	1	12/7/1995	12	Charcoal filter provided for well.
10. Grandview Elementary	Hillsboro	1	8/24/1998	7.9	New well installed. Old well abandoned. Connected to high school's well.
11. Clearmont PWS	Clearmont	2	6/4/2002	5.47	Levels dissipated to no-detect since August 2006.
12. Wrinkle Property	Springfield	1	11/20/2000	4.3	Well currently in use.
13. MOC 1 Travel Plaza	Williamsburg	1	4/12/1999	3.6	Well is closed. Facility is connected to county water system.
14. Crestwood Estates	Osage Beach	1	6/8/2003	3.56	Hooked onto City of Osage Beach.
15. Eureka	Eureka	1	8/7/2002	2.34	Levels dissipated to no-detect since November 2003.
16. Koshkonong School Oregon-Howell R-III	Koshkonong	1	8/26/2002	1.92	Connected to City of Koshkonong drinking water system.
17. Rip's Appliance	Sunrise Beach	2	5/4/1993	500	Benzene was detected, which is not MTBE. Site has ASTs, not USTs.
17 Total Sites		22 Wells Addressed			

What about above ground tanks?

Aboveground tank owners are required to meet safety and fire requirements. This includes having leak and spill prevention equipment. The Missouri Department of Agriculture inspects aboveground fuel storage and dispensing systems. Some of the aboveground tanks are also insured by the Petroleum Storage Tank Insurance Fund, which also makes sure the owner has a current spill prevention plan.

MTBE Timeline 1979 - 2009





MTBE and Human Health

How much MTBE is bad for me?

EPA sets health-based, legally enforceable drinking water standards called Maximum Contaminant Levels for potential drinking water contaminants. MTBE does not currently have a Maximum Contaminant Level, but it is on EPA's Contaminant Candidate List and is being considered for regulation in the future. In lieu of a Maximum Contaminant Level, Missouri's Department of Health and Senior Services has recommended three action levels for MTBE based on the latest risk assessment information. The first action level is a long-term, or lifetime number, which would be equivalent to a Maximum Contaminant Level and it is 20 ppb. A second action level, which would be protective of shorter-term exposures, is 400 ppb. This action level is designed to set a limit on the amount of exposure that a community public water supply could receive from MTBE while obtaining an alternate water supply. The third action level is an acute one where the water would not be considered safe to drink, even for a short period of time. The acute action level is 1,000 ppb.

It is important to know that MTBE has a strong taste and odor that make it unlikely that you would drink enough MTBE to make yourself seriously ill. EPA's Human Health and Criteria Division has recommended keeping contamination below the 20 to 40 ppb range to ensure that your water does not have a bad taste and odor. Levels much higher than this advisory range quickly become unacceptable to the public. EPA estimates that concentrations from 20,000 to 100,000 times higher than this are associated with illness or disease in rodent studies.

How much do we know about MTBE's health effects?

Rats and mice have been given MTBE internally and forced to breathe air rich in MTBE. Some of these animals got sick or developed cancers, apparently as a result of their exposure to high concentrations of MTBE. Few tests have been conducted on humans, and none of these studied the effects of drinking MTBE. Because MTBE is mixed with other harmful chemicals, it has been difficult to study its effects on humans. MTBE is thought to cause cancer based on the animal studies, but only at concentrations far above those likely to be found in humans because of MTBE's offensive taste and smell.

How much of a risk is gasoline?

A federal government study concluded that other components of gasoline pose much more serious cancer risks than MTBE. Benzene, a component of all gasoline, is known to cause cancer at levels much lower than the likely exposure of anyone to MTBE. In addition, gasoline contains other compounds known to pose health risks at high concentrations.

What can I do?

Handle all petroleum products carefully and never pour them on the ground. Make sure that your well is properly constructed and never dump anything on the ground near your well. If you are on a public water system, read the annual Consumer Confidence

Report

that is made available each year describing the quality of your water. If your water smells or tastes of turpentine or has some other unusual smell or taste, contact your local water supplier. For private well owners, please call the Missouri Department of Health and Senior Services at 866-628-9891.

Where can I get more information?

For more information about MTBE call or write:

Missouri Department of Natural Resources

P.O. Box 176

Jefferson City, MO 65102 0176

800-361 4827

www.dnr.mo.gov/contacts.htm

What programs deal with drinking water quality in Missouri?

Missouri Department of Natural Resources' Public Drinking Water Branch

www.dnr.mo.gov/env/wpp/dw-index.htm

Helps ensure the safety of public drinking water by routinely monitoring over 100 chemicals and bacteria that can cause illness.

Missouri Department of Natural Resources' Environmental Services Program

www.dnr.mo.gov/env/esp/index.html

Conducts field sampling and laboratory tests on Missouri's water and air. Responds to emergencies involving hazardous chemicals.

Missouri Department of Natural Resources' Hazardous Waste - Underground Storage Tanks Section

www.dnr.mo.gov/env/hwp/tanks/tanks.htm

Helps prevent contamination caused by corrosion, leaks, overfilling and spills from underground storage tanks.

Missouri Department of Natural Resources' Wellhead Protection Section

www.dnr.mo.gov/env/wpp/wellhd/index.html

Protects the groundwater from contamination by ensuring that all private wells are built to state standards.

Missouri Department of Health and Senior Services - Environmental Epidemiology

E-mail info@dhss.mo.gov. Telephone - 573-751-6102.

Missouri Department of Agriculture – Petroleum Quality and Inspection Program

www.mda.mo.gov/weights/fuel/

Assures that all motor fuels and other fuels meet minimum quality specifications.

Petroleum Storage Tank Insurance Fund

www.pstif.org

Provides pollution liability insurance to owners and operators of underground and aboveground tanks and pays to clean up old tank sites.

Web links to other information about MTBE	
Site Name	Web address
EPA MTBE and Underground Storage Tanks	www.epa.gov/swerust1/mtbe
EPA Gasoline Fuels	www.epa.gov/omswww/consumer/fuels/mtbe/mtbe.htm
EPA MTBE in Drinking Water	www.epa.gov/ogwdw/mtbe.html
EPA Gasoline Fuels (Clean Air Act Advisory Committee panel on Oxygenate Use in Gasoline)	www.epa.gov/oms/consumer/fuels/oxypanel/blueribb.htm
EPA Integrated Risk Information System	www.epa.gov/iris/subst/0545.htm
Lawrence Livermore National Laboratory MTBE and Statistical Data	www.llnl.gov/s_tr/Happel.html
National Water Research Institute	www.ec.gc.ca/ceqg-rcqe/English/HTML/GAAG_MTBE_WQG.cfm
American Petroleum Institute	www.api.org/ehs/groundwater/mtbe_site_character.cfm
Petroleum Storage Tank Insurance Fund	www.pstif.org